

Last Name: _____

Lecture Section: _____

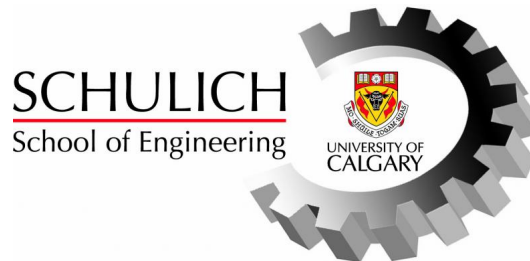
First Name: _____

L01 - Pouyan (Yani) Jazayeri

L02 - Norm Bartley

L03 - Denis Onen

L04 - Andy Knight



ENGG 225 - Fundamentals of Electrical Circuits and Machines

Midterm Examination

Thursday, February 28, 2019

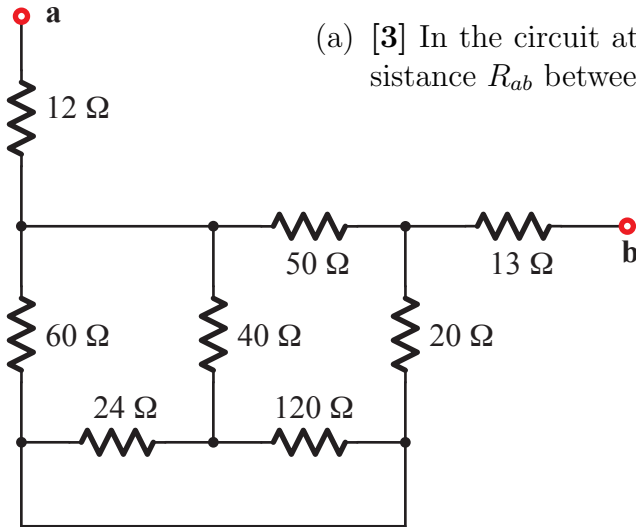
Time: 7:00 - 8:30 PM

Instructions:

- Time allowed is 90 minutes.
 - The examination is closed-book.
 - Only calculators sanctioned by the Schulich School of Engineering (Casio FX-260, Casio FX-300MS, or TI-30XIIS) are permitted in the examination.
 - The maximum number of marks is 45, as indicated; please attempt all questions. The midterm examination counts 25% toward the final grade.
 - Please use a pen or heavy pencil to ensure legibility.
 - Please answer questions in the spaces provided; if space is insufficient, please use the back of the pages.
 - Please show your work; where appropriate, marks will be awarded for proper and well-reasoned explanations.
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UCID: _____

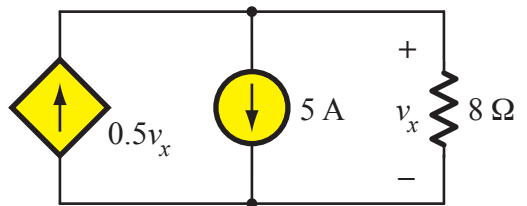
1. [15 marks.] Parts (a)-(e) below each have an identical weighting of three marks. Please answer the questions in the boxes provided.



- (a) [3] In the circuit at left, find the total equivalent resistance R_{ab} between the terminals **a** and **b**.

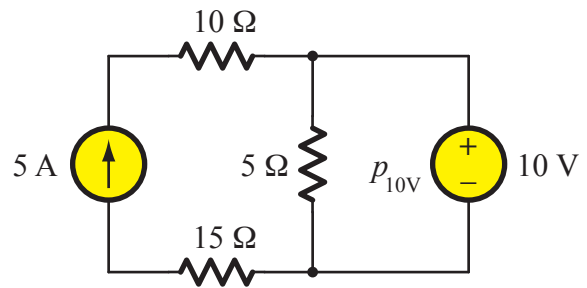
Answer: $R_{ab} =$

- (b) [3] In the circuit at right, find the voltage v_x .



Answer: $v_x =$

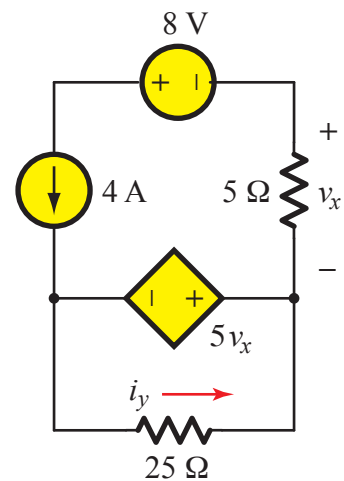
- (c) [3] Calculate the *absolute value* of the power p_{10V} in the circuit at right, and indicate whether this power is delivered or absorbed.



Answer: $|p_{10V}| =$

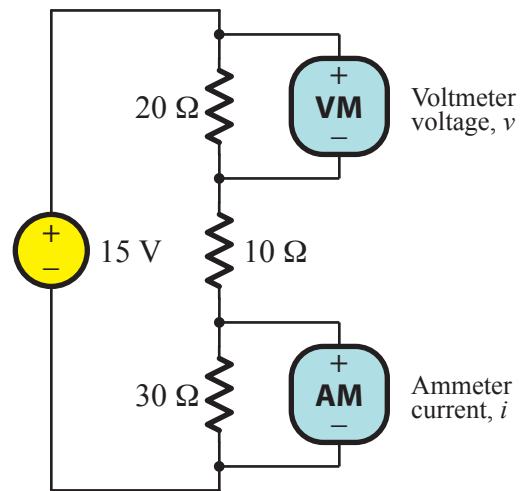
Circle One: *delivered / absorbed*

- (d) [3] In the circuit at right, calculate the current i_y .



Answer: $i_y =$

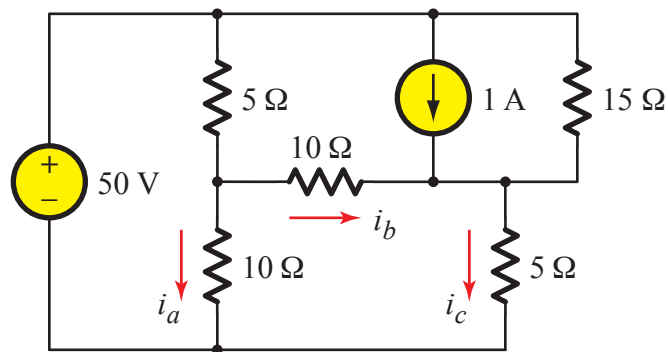
- (e) [3] In the circuit at right, assume that the voltmeter and ammeter are ideal. Give the voltmeter's reading v , and the ammeter's reading i .



Answer: $v =$

Answer: $i =$

2. [14 marks.] Consider the circuit below.

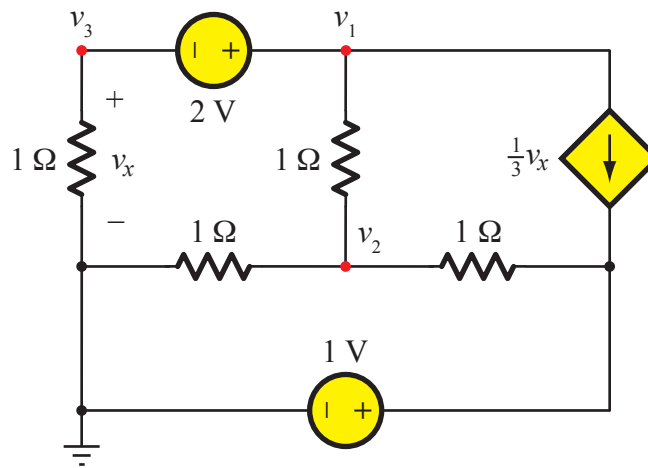


Determine the currents i_a , i_b , i_c , and the power $p_{15\Omega}$ in the 15Ω resistor. Summarize your answers in the following table. (*Hint: The node-voltage method might be easiest!*)

Parameter	Value
i_a (A)	
i_b (A)	
i_c (A)	
$p_{15\Omega}$ (W)	

(Question 2, additional workspace ...)

3. [16 marks.] Consider the circuit below.



- (a) [7] Use the node-voltage method to solve for the node voltages v_1 , v_2 , v_3 .
- (b) [9] Now use the mesh-current method to solve for the *same* node voltages v_1 , v_2 , v_3 .

(Question 3, additional workspace ...)

(Please do not write in this space.)

#1 (15)	#2 (14)	#3 (16)	Total (45)